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<p>(21) International Application Number: PCT/SE85/00438 (22) International Filing Date: 6 November 1985 (06.11.85) (31) Priority Application Number: 8406056-5 (32) Priority Date: 30 November 1984 (30.11.84) (33) Priority Country: SE (71) Applicant (for all designated States except US): E.M.E. SYSTEM AKTIEBOLAG [SE/SE]; S-669 00 Deje (SE). (72) Inventor; and (75) Inventor/Applicant (for US only) : WEIMERS, Olof [SE/SE]; Rinsmansgatan 12, S-669 00 Deje (SE). (74) Agent: HYNELL, Magnus; Hynell Patenttjänst AB, Box 236, S-683 02 Hagfors 2 (SE).</p>		<p>(81) Designated States: AT, AT (European patent), AU, BB, BE (European patent), BG, BR, CH, CH (European patent), DE (Utility model), DE (European patent), DK, FI, FR (European patent), GB, GB (European patent), HU, IT (European patent), JP, KP, KR, LK, LU, LU (European patent), MC, MG, MW, NL, NL (European patent), NO, RO, SD, SE, SE (European patent), SU, US. Published <i>With international search report.</i> <i>In English translation (filed in Swedish).</i></p>
<p>(54) Title: ARM REST</p> <p>(57) Abstract</p> <p>An arm rest for a chair, in particular for a vehicle seat, comprising a pad and parallel side walls, said pad being mounted on a support. The arm rest is lockable in different positions relative to the rail by special forcing means to this purpose. The support (2) of the pad (1) is joined to each of the side walls (8, 9) by hinges (3/5, 6/7). The turning axes of said hinges are parallel to said rail. Means (15) are provided to permit automatic changing of the distances from the center of said rail to each of the respective turning axes of said hinges as the arm rest (d) is inclined outwards or inwards relative to the chair, said side walls remaining parallel to each other and the inclination of said pad being able to remain constant during such inclinational change of the arm rest.</p>		

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- 1 -

ARM REST

TECHNICAL SCOPE

- 5 The invention relates to an arm rest for a chair, particularly
an arm rest for a vehicle seat, comprising an arm pad and
parallel side walls, said pad being mounted on a support, said
arm rest being mounted on a guide rail, said rail normally
being essentially horizontal and extending through the arm rest
10 under the arm pad and between the side walls, and said arm
rest being lockable in different locking positions relative to
said rail by forcing means.

BACKGROUND ART

- 15 A plurality of suggestions have been made over the years as to
the proper design of an arm rest to make it possible for the
driver of a vehicle to assume a working position which is as
close to the ergonomically ideal position as possible. .
Different, rather complex systems of links and arms have
20 provided solutions which permit good adjustability of the arm
rest. So far it has proven difficult to solve the problem of
making the arm rest easily adjustable while keeping the
orientation of the arm pad constant relative to the horizontal
plane irrespective of any displacement of the arm rest sideways
25 or vertically.

DISCLOSURE OF THE INVENTION

- The present invention relates to an arm rest support structure,
intended to permit keeping the orientation of the arm rest
30 relative to the horizontal plane unaltered, even when the arm
rest is moved up or down, is tilted outwards or inwards relative
to the seat, is moved forwards or backwards, or is displaced by
some combination of these movements. This makes it possible for
the person using the arm rest to adjust it without difficulty to
35 suit his working position, his body size, and his occupation.

- 2 -

Another object of the invention is to provide an arm rest which is relatively easy to manufacture and which is mountable on and usable with existing driver's seats.

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These and other objects may be realized by a device according to the appended patent claims. Further characteristics, aspects, and advantages of the invention will become apparent from the following description of a preferred embodiment.

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BRIEF DESCRIPTION OF DRAWINGS

In the following description of a preferred embodiment reference will be made to the accompanying drawings, wherein

15 Fig. 1 is a perspective view illustrating the general features of an arm rest of a chair;

Fig. 2 is a sectional view of the arm rest according to the chosen embodiment of the invention; and

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Fig. 3 shows the same arm rest at a different inclination.

DESCRIPTION OF A PREFERRED EMBODIMENT

In Fig. 1 is illustrated a vehicle seat a, a back rest thereof b, and a brace c. The brace c extends behind the back rest b and forwards along the sides of the seat a. In Fig. 1 only the left side of the assembly is depicted. The brace c, the illustrated part 16 of which is tubular, is fitted with an arm rest d. The arm rest d comprises an upper part e in the form of an arm pad 1 on top of a support in the form of an extruded aluminum plate 2, Fig. 2, and a pair of sides f and g. The arm rest d may be affixed to the guide rail/brace c (the pipe 16) by means of a handle h.

35 The construction of the arm rest d is shown in greater detail in

- 3 -

Figs. 2 and 3. Underneath the aluminum plate 2, which supports the pad 1, there is a partly cylindrical groove 3 and a space 4, the ends 22 of said space being oval recesses with flat bottoms. In the groove 3 is fitted a bent edge 5 and the space 4 houses a cylindrical rod 6, the ends of which fit said recesses and which is partly enclosed by a grip 7. The edge 5 and the grip 7 may be turned relative to said groove 3 and space 4, respectively, and are the upper ends of respective sides 8, 9, said sides consisting of plates which in the initial position according to Fig. 1 extend downwards essentially perpendicularly to the plane of the pad 1.

In the side plates 8,9 there are slots 10,11, extending essentially vertically. Through these slots 10,11 and through a pair of holes 30,31 in a spacing piece 15 runs a locking element in the form of a threaded bolt 12, perpendicularly to the side plates 8,9. The diameter of the bolt 12 is slightly less than that of the holes 30,31. Between the bolt head 13 and a nut 14 there are placed two cup springs 23, pressing against the external sides of the side plates.

Between the side plates there is placed a distance piece 15 in the form of an extruded aluminum profile 15. Fully along the distance piece 15 runs a partly cylindrical groove 25, partly enclosing the pipe 16. A pair of lateral extensions on each side of the distance piece have been designated 26,27 and 28,29. The external sides 26a,27a and 28a,29a, respectively, are parallel to each other and to the side walls 8,9.

The pipe 16 extends essentially horizontally, parallel to the extension of the pad 1, and is attached to the dorsal side of the back rest b according to the art. By tightening the nut 14 the side plates 8,9 are locked in their respective positions relative to the distance piece 15 and to the pipe 16 by friction between the side plates 8,9 and the surfaces 26a,27a and 28a,29a

- 4 -

on the distance piece and by clamping the distance piece 15 to the pipe 16, respectively. Thereby the pad 1 is locked with respect to the chair assembly.

- 5 Side paddings 17 of foamed plastic are attached to said side walls 8,9, said paddings having holes 18 through which to enter the bolt 12. The empty spaces in the groove 3 inside the edge 5 and on both sides of the rod 6 in the spaces 4 are intended to permit the bottom side of the pad 1 to assume an
- 10 inclined position relative to the side plates, as is apparent from Fig. 3. The slots 10,11 are elongated to permit the side plates to be displaced vertically. For the same reason there is provided an empty space 19 inside the bolt head 13 and a recess
- 15 with a handle to facilitate loosening during adjustment of the arm rest.

It is obvious from Figs. 1 and 2 that as long as the side plates 8 and 9 and consequently their top parts 5 and 7, respectively,

20 are not in their bottom positions relative to the pipe 16, the pad 1 may assume, within certain geometrically determined limits, a completely arbitrary position. Its vertical position, its inclination forwards-backwards, its inclination sideways, its position sideways and position forwards-backwards may be

25 varied. These position parameters are also independent of each other. The point of reference in the assembly is the pipe 16. This pipe does not necessarily have to be exactly horizontal and neither does it have to be directed exactly straight ahead, since the adjustability of the arm rest may compensate for

30 variations in the position of the pipe relative to the seat of the chair. Figs. 1 and 2 also show that it is a characteristic feature of the construction that the distance between the side plates 8 and 9 remains constant, as determined by the distance piece 15. The side plates are not extendable, but

35 are of constant length. They form the long sides of an

- 5 -

elongate parallelogram, the one short side of which is the distance between the hinge joints 3-5 and 4-6. The more the arm rest d inclines, the longer this distance will be, provided the pad 1 and its support plate 2 remain at a constant angle to the horizontal plane. This is made possible by letting the rod 6, which is part of one of the two hinges, move freely in the oval recesses 22.

The materials stated are naturally not the only possible ones for an arm rest according to the invention. The relations of the dimensions of the different parts of the arm rest to each other are not limited to those of the embodiment described. The possibility of limiting certain of the possible adjustments for certain applications or the pre-setting of some of the parameters by means of some spring force or pressure medium also lie within the scope of the invention. Further, it is for instance possible to replace the clamping bolt and nut by an excenter arm or some corresponding locking means known in the art, and still obtain the same functional result. Other modifications of the embodiment shown may be done without leaving the realm of the inventive concept.

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- 6 -

CLAIMS:

1. An arm rest for a chair, in particular for a vehicle seat, said arm rest comprising a pad and parallel side walls, said pad being mounted on a support, said arm rest being mounted on
- 5 a guide rail which is normally positioned horizontally and extends through the arm rest underneath said pad between said side walls, said arm rest further being lockable in different locking positions relative to said rail by forcing means, c h a r a c t e r i z e d i n that said support (2) for said
- 10 pad (1) is joined to each of said side walls (8, 9) by hinges (3/5, 6/7), that the turning axis of each of said hinges is parallel to said rail, and that means (15) are provided to permit automatic changing of the distances from the center of said rail to each of the respective turning axes of said hinges
- 15 as the arm rest (d) is inclined outwards or inwards relative to the chair, said side walls remaining parallel to each other and the inclination of said pad being able to remain constant during such inclinational change of the arm rest.
- 20 2. An arm rest according to claim 1, c h a r a c t e r i z e d i n that said means comprise at least one distance piece (15), located between said side walls and having parallel side faces (26a, 27a, 28a, 29a) pressing
- 25 piece between the external surfaces of said side faces adjacent the side walls being considerable, and that said guide rail extends through a hole (25) or cut in said distance piece, said forcing means when in their locking state being arranged to press said side walls against said side faces of the distance
- 30 piece and to simultaneously clamp the distance piece to the rail.

- 7 -

3. An arm rest according to claim 1,
c h a r a c t e r i z e d i n that said pad support (2) and
said side walls (8, 9) form one of the short sides and the two
long sides, respectively, of an imaginary elongated parallelo-
5 gram, in which the distance between said long sides is constant,
the corner angles change as the lateral inclination of the arm
rest changes, the length of the long sides is constant, but
the length of the short sides varies with said inclination.
- 10 4. An arm rest according to claim 2,
c h a r a c t e r i z e d i n that said side walls are
individually displaceable upwards and downwards, independently
of each other, by sliding against the parallel side faces
of said distance piece.
- 15 5. An arm rest according to claim 2,
c h a r a c t e r i z e d i n that said forcing means comprise
a threaded bolt (12) or a locking member corresponding thereto,
extending through the side walls and the distance piece,
20 perpendicularly to the side walls and to said parallel side
faces, and that there are holes for said locking member in the
side walls and in the distance piece, said holes (10, 11) in the
side walls being elongated openings, the holes (30, 31) in
the distance piece being just large enough to let the locking
25 member (12) through, a turning of the arm rest about the rail
(16) thus moving the arm rest outwards or inwards relative to
the chair, a turning of the pad with its support about the two
hinges causing a change in the inclination of the pad relative
to the side walls, a displacement of the side walls upwards or
30 downwards causing a change in the vertical position of the pad,
and a turning of the side walls about the locking member causing
a change in the forwards-backwards inclination of the pad.

- 8 -

6. An arm rest according to claim 1,
c h a r a c t e r i z e d i n that at least one of the two
hinges is displaceable relative to the pad support (2) to permit
adaptation to the changing distance between the hinge axis due
5 to the movement of the side walls relative to each other while
keeping the distance between the side walls constant.

7. An arm rest according to claim 1,
c h a r a c t e r i z e d i n that one of the two said hinges
10 at the upper ends of the side walls is in the form of a bent
part (5) of the one side wall (8) fitting into a groove (3) on
the under side of the pad, said groove being formed by parts of
two concentric cylindrical surfaces, while the other is in the
form of a rod (6), parallel to the upper edges of the side
15 walls, the ends of said rod entering recesses (22) perpendicular
to said upper edges and located on the under side of the pad,
said rod being essentially encompassed by a partly cylindrical
grip (7) at the upper end of the other side wall (9), the rod
thus being displaceable in said recesses as the angle of the pad
20 to the side walls and hence the distance between the hinges
are changed, as a result of keeping the distance between the
side walls constant.

8. An arm rest according any one of the preceding claims,
25 c h a r a c t e r i z e d i n that the side walls are covered
by padding on the outside, and that the padding is provided with
holes (19, 20) on one side in the form of a hole through which
to enter the locking member (12) and an inner furrow to permit
the holding element (13) of the locking member to move up and
30 down relative to the side wall in question, and on the other
side in the form of an essentially vertical opening for an
element (14) interacting with the locking member, said opening
accomodating said element in its different positions relative
to the side wall in question.

- 9 -

9. An arm rest according to claim 8,
c h a r a c t e r i z e d i n that said locking member
consists of a threaded bolt with a bolt head and a nut, and that
the force of friction needed for the locking of the side walls
5 to the distance piece and of the distance piece to the rail is
transmitted by cup springs (23) located between the bolt head
and the outside of one side wall and between the nut and the
outside of the other side wall, respectively.

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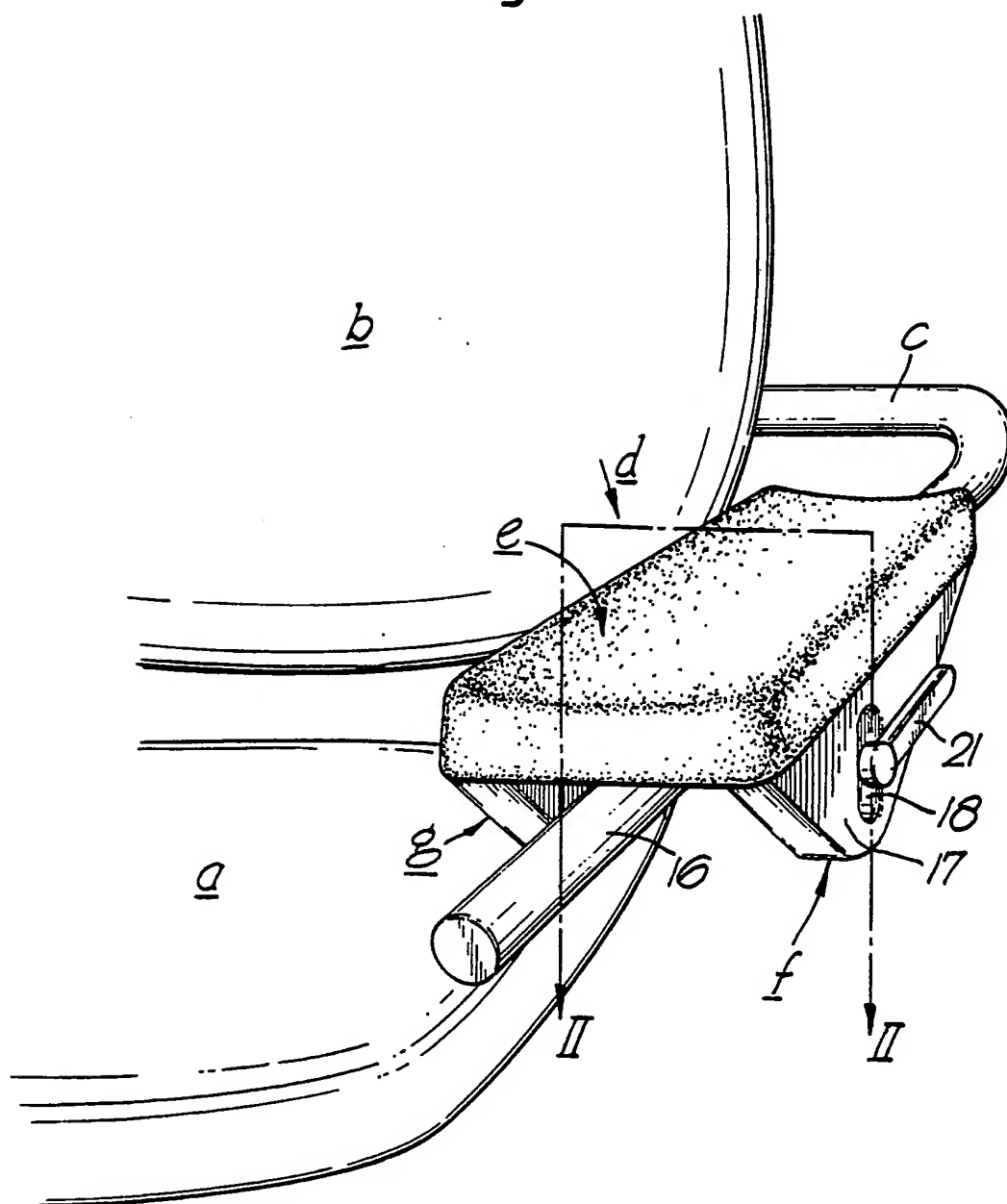
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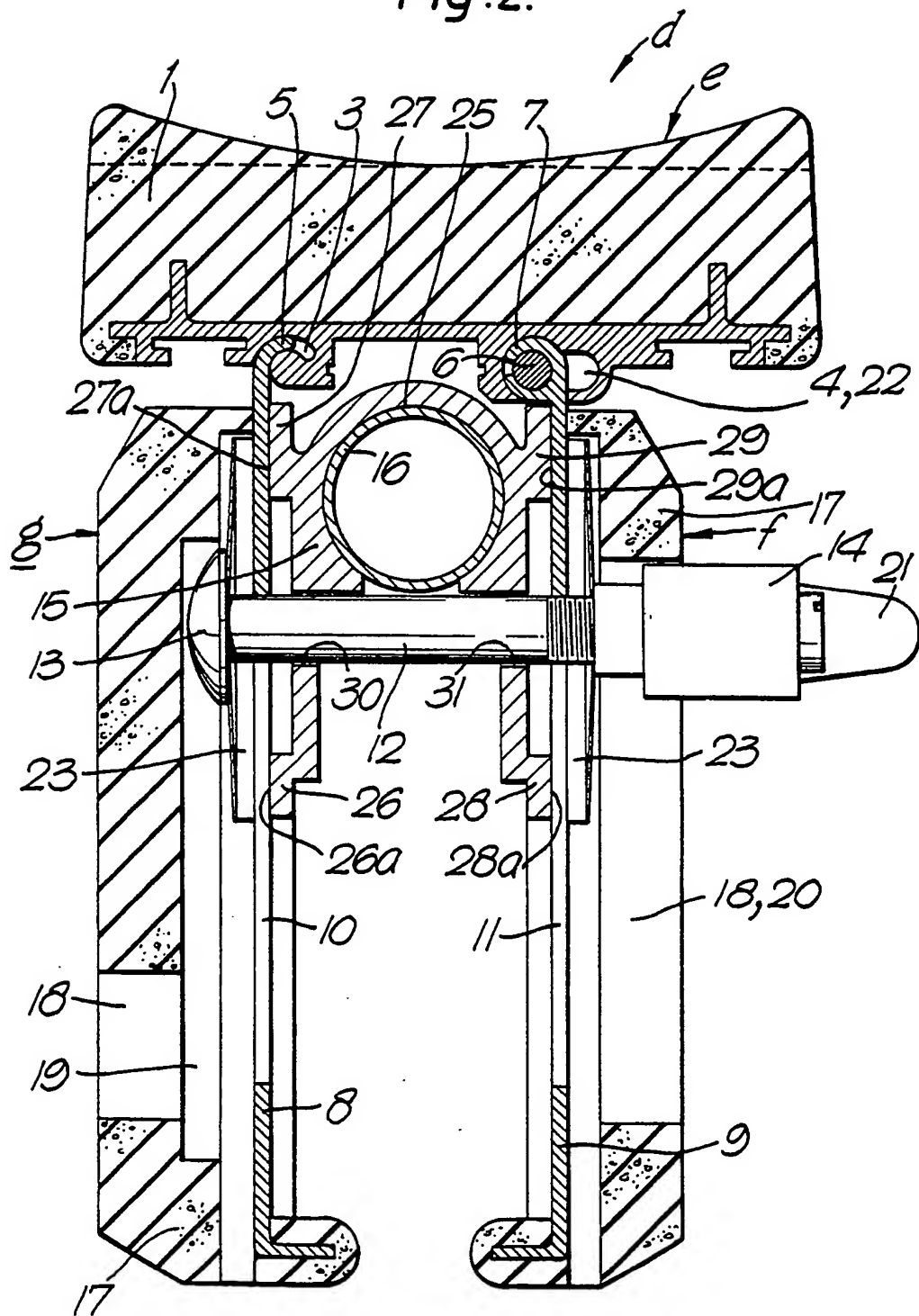
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Fig. 1.



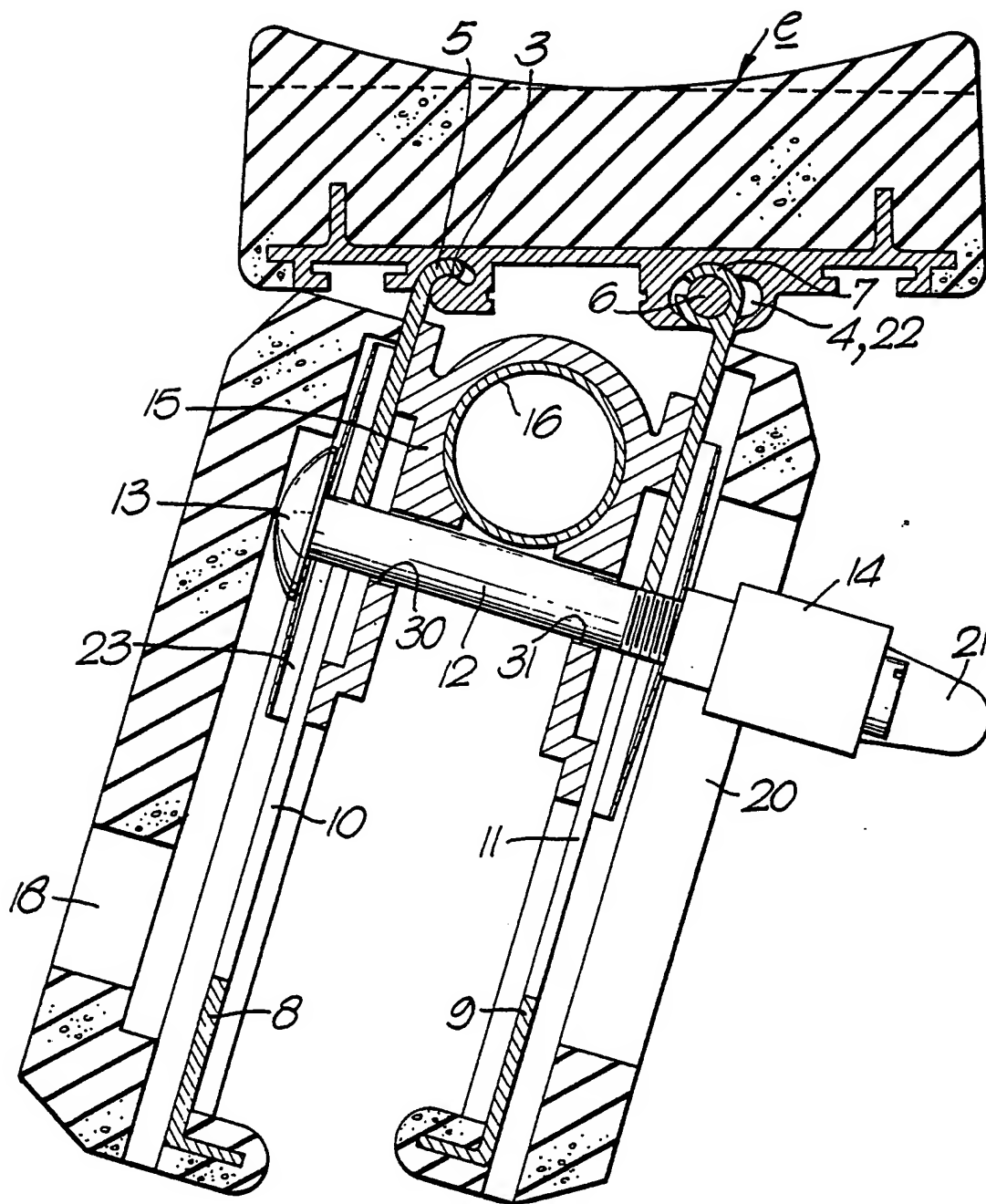
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Fig.2.



3/3

Fig. 3.



INTERNATIONAL SEARCH REPORT

PCT/SE85/00438

International Application No

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) *		
According to International Patent Classification (IPC) or to both National Classification and IPC 4		
B 60 N 1/06, A 47 C 7/54		
II. FIELDS SEARCHED		
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Classification System	Classification Symbols	
IPC 4	A 47 C 7/54; B 60 N 1/00-/06	
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IV. CERTIFICATION		
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1986-01-23	1986-01-28	
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